This species is an abundant weed in Washington County along roadsides, in no-till fields, and in wheat fields. In competition with wheat, it is not uncommon to find *L. austrinum* plants 1 to 1.2 m tall. Without crop competition plants are generally less than 0.5 m tall.

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THE IMPENDING NATURALIZATION OF *PISTACIA CHINENSIS* (ANACARDIACEAE) IN EAST TEXAS — Why do some exotic woody plants escape from cultivation and naturalize quickly while others require decades to do so? *Pistacia chinensis* Bunge is a Chinese tree that has been slowly naturalizing in South Central and East Texas. Even though this ornamental tree was introduced to cultivation in 1897 (Chittenden 1951) and according to Texas Agricultural Experiment Station records has been cultivated in Texas since 1918, this is the first report of the species naturalizing in North America (Shetler and Skog 1978). In contrast, another well-known Chinese tree, *Sapium sebiferum* (L.) Roxb., introduced to cultivation in about 1850 and to Texas in the early 1900's (Jamieson and McKinney 1938), has quickly naturalized and is displacing native coastal marsh species.

Barkley (1943) listed several exotic members of the Anacardiaceae but he and later botanists did not consider *P. chinensis* to be naturalized in Texas (Johnston 1988) or even in North America (Shetler and Skog 1978). *Pistacia atlantica* Desf. is listed as established in Washington Co. Utah (Welsh, Atwood, Goodrich, and Higgins 1987).

Pistacia chinensis was not widely planted in Texas until after the 1960's. Shinners (1958) noted that "*P. chinensis* is rarely cultivated" and did not indicate that it had naturalized in the Dallas area. Since 1958 *P. chinensis* has become increasingly popular (Browse 1988) in the nursery industry throughout the Southern U. S. It is cultivated for its autumn color in many Texas counties.

One of the *first* locations where the tree was evaluated in the state was at the old Texas Agricultural Experiment Station nursery in College Station. By 1928, it became recognized that *P. chinensis* was well adapted there. Today seedling trees of various ages from young to flowering age can be found in the vicinity of defunct nurseries on the Texas A&M University (TAMU) Campus. Additional trees distributed by The Texas Forest Service were planted at the TAMU Floriculture Nursery in the 1940's as well as at various homes in Bryan and College Station and, to a limited extent, throughout East Texas as it became recognized that the ornamental tree was well adapted there. Seedlings distributed by the Texas Forest Service in the 1940's are now maturing and serving as seed sources for the naturalization of the species in East Texas. Although many plants have been produced and sold by commercial Texas nurseries in the last decade, these trees are still too young to reproduce.

I first observed about 20 young *P. chinensis* trees and seedlings naturalizing in the vicinity of the old Floriculture Nursery in College Station in 1972 and now a few of these second generation trees are fruiting (*McWilliams M7299030*, TAES) and producing seedlings. Young trees ranging in age from a few years to about 20 years can be found in disturbed Post Oak woodlands in central Brazos Co. Like many other exotic deciduous trees, *P. chinensis* seedlings retain their leaves longer than most of the native plants and their yellow-orange leaves are easily seen along the edges of woods in November or early December. Seedlings of the tree have also been observed in East Texas counties.

Long-distance dispersal of *P. chinensis* by man has already occurred throughout much of the state. Local dispersal by birds has and will probably continue to occur. The pattern of seed dispersal and ultimately of seedlings is related to the territoriality of the birds that disperse *P. chinensis* seeds (unpublished observation). Seedlings are often found in fence rows and beneath older trees and shrubs.

Based on the slow spread of *P. chinensis* at College Station and the observation of seedlings in other Texas cities, I hypothesize that similar patterns of "naturalization" will occur in other areas of East Texas as the now widely

planted trees mature. In plant demography, older trees that produce large seed or pollen crops have a greater influence on reproduction than do younger trees. Obvious factors influencing rate of naturalization of cultivated plants are: date of introduction, numbers of plants produced commercially, length of life cycle, age to flowering, growth rate, breeding system, seed set and mode of dispersal. The ratio of female to male trees is particularly important in a species such as *P. chinensis* that produces many inviable seeds.

In comparing traits of *P. chinensis* and *S. sebiferum* we see that the former species was not initially as widely planted, takes more years to reach maturity, has a slower rate of growth but greater cold hardiness, and is less dependable in producing viable seed (Browse 1988) possibly because it is dioecious. Thus there appear to be several reasons why *P. chinensis* is slower to naturalize. On the other hand, the seed stratification requirement and the greater cold tolerance of *P. chinensis* indicate that the species will eventually naturalize farther north than have some exotics such *S. sebiferum*. Based on the performance of these plants and the tolerance range physiology of the species, additional *P. chinensis* naturalization may be expected in Hardiness Zone 8 (U.S.D.A. 1990) in East and South Central Texas. Collectors interested in testing this hypothesis should look within a kilometer of old female trees for seedlings and saplings of this exotic. The native, odd-pinnately compound *Pistacia texana* Swingle is now widely cultivated in Texas but I have not seen this species naturalize. The evenly compound leaves of *P. chinensis* are much larger than those of the native species.

To germinate uniformly, seeds of this exotic apparently require a period of cold stratification (Browse 1988) which they are unlikely to receive regularly in extreme South Texas, Hardiness Zone 10. Young plants and seedlings are damaged when temperatures drop below -10 degrees F and thus it is unlikely that the plant can naturalize as far north as Zone 6.

In summary, *P. chinensis* has slowly naturalized in parts of Brazos County Texas, and seedlings have been observed in other counties near mature trees. There appear to be several developmental and ecological reasons for the slow rate of naturalization of *P. chinensis*. Based on the adaptation of the old trees and their successful reproduction, where male and female trees occur together at several distant locations, I predict that the tree will naturalize over the next decade in Zone 8 of East Texas.

Assuming no major climatic change, the large number of cultivated trees throughout East Texas that are approaching maturity herald an im-

pending period of widespread seed and subsequent seedling production and the eventual widespread naturalization of this exotic in disturbed areas of South Central and East Texas.

The extent of drought, shade and flood tolerance of *Pistacia chinensis* and whether the species will be able to invade undisturbed plant communities in Texas remain to be seen.

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THE REDISCOVERY OF *CAREX GIGANTEA* (CYPERACEAE) IN TEXAS — *Carex gigantea*Rudge is found infrequently throughout its range, however, it can be locally common. The most southwesterly extension of its range is Oklahoma and Texas. The last collection record in Texas was 47 years ago by *E. Boon 224* (TEX), 16 July 1943 (Jones and Hatch 1990). This distinct species was recently collected in Newton Co.: 28 July 1990, *S. & G. Jones 5665 & J.K. Wipff* (SMU, TAES, TX). Specimens were collected at the edge of a clear-cut area interfacing with a low lying swampy area. The collection site is 1.7 miles (2.8 km) NW on a dirt road extension of Spur 272 S with its junction with TX 12 in Deweyville, Neitsch et al (1982) classify the soil as the Gaillime-Spurger Association . However, the